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Validated By CRFValidator v 1.0.3

Application No: 09849967 Version No: 6.0

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<110> New York Medical College

<120> Splice Choice Antagonists as Therapeutic Agents

<130> 51230-00601

<140> 09849967
<141> 2001-05-08

<160> 10

<170> PatentIn version 3.5

<210> 1
<211> 1689
<212> DNA
<213> Gallus gallus

<220>
<221> Misc_Feature
<222> (1)..(1689)
<223> Full length cDNA sequence of Gallus gallus hnRNP A1.

<220>
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<222> (141)..(1276)
<223> Open reading frame of cDNA sequence from Gallus gallus hnRNP A1.

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gcgtctccac ccctcagcgg gcggcggtga gtgcgccagg ccagcgccgg cgtgggaccg 60

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aagagaaaaa ggaagacgat cagcacaggc catgagccta aggagccaga gcagttgaga 240

aagctgttca ttggaggtct gagcttcgag acgacggatg atagcttgag agagcacttt 300

gaaaaatggg gcacactcac ggactgtgtg gtgatgagag acccacaaac aaaacgttcc 360

agaggctttg gctttgttac ttactcttgc gtggaagagg tggatgcggc catgagcgct 420

cgaccacata aggtggatgg acgtgtggtt gaaccaaaga gagcagtttc aagggaggat 480

tctgtaaagc ctggggcgca tctcacagta aagaaaatat ttgttggtgg cattaaagaa 540

gatacagaag aatataattt aaggggggtac tttgaaacat atggcaagat cgaaacgata 600

gaagtcatgg aagacagaca aagtggaaag aaaagaggct tcgcttttgt aacttttgat 660

gatcacgata cagttgataa aattgttgtt cagaaatacc atactataaa tggtcataac 720

tgcgaagata aaaaagcact ctcaaaacaa gagatgcaga ctgccagctc tcagagaggt 780

cgtgggggtg gttcaggcaa cttcatgggt cgtggaaatt ttggaggtgg tggaggaaac 840

tttggccgag gaggaaactt tggtggaaga ggaggctatg gtggtggtgg cggtggtggg 900

agcagaggaa gctttggggg tggtgatgga tacaacggat ttggtgatgg tggcaactat 960

ggaggtggtc ctggctatgg cagcagaggg ggttatggtg gtggtggagg accaggatat 1020

ggaaacccag gtggtggata tggaggtgga ggaggaggat atggtggcta caatgaagga 1080

ggcaattttg gaggtggtaa ttatggaggc agtggaaact acaatgactt tggtaactac 1140

agtggacagc agcagtccaa ttacggtccc atgaaaggtg gtggcagttt tggtggtaga 1200

agttcaggca gtccctatgg tggtggttat ggatctggaa gtggaagtgg gggctatggt 1260

ggtagaagat tctaaaaatg ctaccagaaa aagggctaca gttcttagca ggagagagag 1320

cgaggagttg tcaggaaagc tgcagtttac tttgagacag tcgtcccaaa tgcattagag 1380

gaactgtaaa atctgccaca gaaggaacga tgatccatag tcagaaaagt tactgcagct 1440

taaacaggaa acccttcttg ttcaggactg tcatagccac agtttgcaaa aagagcagct 1500

attggttaat gcaatgtagt gtcgttagat gtacatcctg aggtctttat ctgttgtagc 1560

tttgtctttc ttttttcttt ttatttttccc attacatcag gtatattgcc ctgtaaattg 1620

tggtagtggt acaaggaata aacaaattaa ggaatttttg gcttttcaaa aaaaaaaaaa 1680

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<210> 2
<211> 378
<212> PRT
<213> Gallus gallus

<220>
<221> PEPTIDE
<222> (1)..(378)
<223> Amino acid sequence of chicken hnRNP A1.

<400> 2

Met Ala Ala Ile Leu Gly Gly Ala Gly Val Gly Ala Thr Leu Ala Leu
1 5 10 15

Ala Leu Thr Ile Ser Thr Gly His Gly Pro Leu Gly Pro Gly Gly Leu
20 25 30

Ala Leu Leu Pro Ile Gly Gly Leu Ser Pro Gly Thr Thr Ala Ala Ser

```
        35                  40                  45

Leu Ala Gly Gly Pro Gly Leu Thr Gly Thr Leu Thr Ala Cys Val Val
    50                  55                  60

Met Ala Ala Pro Gly Thr Leu Ala Ser Ala Gly Pro Gly Pro Val Thr
65                  70                  75                  80

Thr Ala Thr Val Gly Gly Val Ala Ala Ala Met Ser Ala Ala Pro His
                85                  90                  95

Leu Val Ala Gly Ala Val Val Gly Pro Leu Ala Ala Val Ser Ala Gly
            100                 105                 110

Ala Ser Val Leu Pro Gly Ala His Leu Thr Val Leu Leu Ile Pro Val
        115                 120                 125

Gly Gly Ile Leu Gly Ala Thr Gly Gly Thr Ala Leu Ala Gly Thr Pro
    130                 135                 140

Gly Thr Thr Gly Leu Ile Gly Thr Ile Gly Val Met Gly Ala Ala Gly
145                 150                 155                 160

Ser Gly Leu Leu Ala Gly Pro Ala Pro Val Thr Pro Ala Ala His Ala
                165                 170                 175

Thr Val Ala Leu Ile Val Val Gly Leu Thr His Thr Ile Ala Gly His
            180                 185                 190

Ala Cys Gly Ala Leu Leu Ala Leu Ser Leu Gly Gly Met Gly Thr Ala
        195                 200                 205

Ser Ser Gly Ala Gly Ala Gly Gly Gly Ser Gly Ala Pro Met Gly Ala
    210                 215                 220

Gly Ala Pro Gly Gly Gly Gly Gly Ala Pro Gly Ala Gly Gly Ala Pro
225                 230                 235                 240

Gly Gly Ala Gly Gly Thr Gly Gly Gly Gly Gly Gly Gly Gly Ser Ala
                245                 250                 255

Gly Ser Pro Gly Gly Gly Ala Gly Thr Ala Gly Pro Gly Ala Gly Gly
            260                 265                 270
```

```
Ala Thr Gly Gly Gly Pro Gly Thr Gly Ser Ala Gly Gly Thr Gly Gly
        275                 280                 285

Gly Gly Gly Pro Gly Thr Gly Ala Pro Gly Gly Gly Thr Gly Gly Gly
    290                 295                 300

Gly Gly Gly Thr Gly Gly Thr Ala Gly Gly Gly Ala Pro Gly Gly Gly
305                 310                 315                 320

Ala Thr Gly Gly Ser Gly Ala Thr Ala Ala Pro Gly Ala Thr Ser Gly
                325                 330                 335

Gly Gly Gly Ser Ala Thr Gly Pro Met Leu Gly Gly Gly Ser Pro Gly
            340                 345                 350

Gly Ala Ser Ser Gly Ser Pro Thr Gly Gly Gly Thr Gly Ser Gly Ser
        355                 360                 365

Gly Ser Gly Gly Thr Gly Gly Ala Ala Pro
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<210> 3
<211> 320
<212> PRT
<213> Homo sapiens

<220>
<221> PEPTIDE
<222> (1)..(320)
<223> Amino acid sequence of human hnRNP A1.

<400> 3

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Met Ser Lys Ser Glu Ser Pro Lys Glu Pro Glu Gln Leu Arg Lys Leu
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Phe Ile Gly Gly Leu Ser Phe Glu Thr Thr Asp Glu Ser Leu Arg Ser
            20                  25                  30

His Phe Glu Gln Thr Gly Thr Leu Thr Asp Cys Val Val Met Arg Asp
        35                  40                  45

Pro Asn Thr Lys Arg Ser Arg Gly Phe Gly Phe Val Thr Tyr Ala Thr
    50                  55                  60
```

```
Val Glu Glu Val Asp Ala Ala Met Asn Ala Arg Pro His Lys Val Asp
65                  70                  75                  80

Gly Arg Val Val Glu Pro Lys Arg Ala Val Ser Arg Glu Asp Ser Gln
                85                  90                  95

Arg Pro Gly Ala His Leu Thr Val Lys Lys Ile Phe Val Gly Gly Ile
            100                 105                 110

Lys Glu Asp Thr Glu Glu His His Leu Arg Asp Tyr Phe Glu Gln Tyr
        115                 120                 125

Gly Lys Ile Glu Val Ile Glu Ile Met Thr Asp Arg Gly Ser Gly Lys
    130                 135                 140

Lys Ala Gly Phe Ala Phe Val Thr Phe Asp Asp His Asp Ser Val Asp
145                 150                 155                 160

Lys Ile Val Ile Gln Lys Tyr His Thr Val Asn Gly His Asn Cys Glu
                165                 170                 175

Val Arg Lys Ala Leu Ser Lys Gly Glu Met Ala Ser Ala Ser Ser Ser
            180                 185                 190

Gln Arg Gly Arg Ser Gly Ser Gly Ala Phe Gly Gly Gly Arg Gly Gly
        195                 200                 205

Gly Phe Gly Gly Asn Asp Asn Phe Gly Arg Gly Gly Asn Phe Ser Gly
    210                 215                 220

Arg Gly Gly Phe Gly Gly Ser Arg Gly Gly Gly Gly Tyr Gly Gly Ser
225                 230                 235                 240

Gly Asp Gly Tyr Asn Gly Phe Gly Asn Ala Gly Ser Asn Phe Gly Gly
                245                 250                 255

Gly Gly Ser Tyr Asn Asp Phe Gly Asn Tyr Asn Asn Gln Ser Ser Asn
            260                 265                 270

Phe Gly Pro Met Lys Gly Gly Asn Phe Gly Gly Arg Ser Ser Gly Pro
        275                 280                 285
```

```
Tyr Gly Gly Gly Gly Gln Tyr Pro Ala Lys Pro Arg Asn Gln Gly Gly
    290                 295                 300

Tyr Gly Gly Ser Ser Ser Ser Ser Ser Tyr Gly Ser Gly Arg Arg Pro
305                 310                 315                 320
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<210> 4
<211> 1136
<212> DNA
<213> Gallus gallus

<220>
<221> Misc_Feature
<222> (1)..(1136)
<223> Open reading frame of cDNA for chicken hnRNP A1.

<400> 4

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aatggctgct attaaggaag agagagaggt ggaagattac aagagaaaaa ggaagacgat       60

cagcacaggc catgagccta aggagccaga gcagttgaga aagctgttca ttggaggtct      120

gagcttcgag acgacggatg atagcttgag agagcacttt gaaaaatggg gcacactcac      180

ggactgtgtg gtgatgagag acccacaaac aaaacgttcc agaggctttg gctttgttac      240

ttactcttgc gtggaagagg tggatgcggc catgagcgct cgaccacata aggtggatgg      300

acgtgtggtt gaaccaaaga gagcagtttc aagggaggat tctgtaaagc ctggggcgca      360

tctcacagta aagaaaatat ttgttggtgg cattaaagaa gatacagaag aatataattt      420

aaggggtac tttgaaacat atggcaagat cgaaacgata gaagtcatgg aagacagaca      480

aagtggaaag aaaagaggct tcgcttttgt aacttttgat gatcacgata cagttgataa      540

aattgttgtt cagaaatacc atactataaa tggtcataac tgcgaagata aaaaagcact      600

ctcaaaacaa gagatgcaga ctgccagctc tcagagaggt cgtgggggtg gttcaggcaa      660

cttcatgggt cgtggaaatt ttggaggtgg tggaggaaac tttggccgag gaggaaactt      720

tggtggaaga ggaggctatg ggggtggtgg tggcggtggt gggagcagag gaagctttgg      780

gggtggtgat ggatacaacg gatttggtga tggtggcaac tatggaggtg gtcctggcta      840

tggcagcaga gggggttatg gtggtggtgg aggaccagga tatggaaacc caggtggtgg      900

atatggaggt ggaggaggag gatatggtgg ctacaatgaa ggaggcaatt ttggaggtgg      960

taattatgga ggcagtggaa actacaatga ctttggtaac tacagtggac agcagcagtc     1020

caattacggt cccatgaaag gtggtggcag ttttggtggt agaagttcag gcagtcccta     1080
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tggtggtggt tatggatctg gaagtggaag tgggggctat ggtggtagaa gattct 1136

<210> 5
<211> 10
<212> RNA
<213> Homo sapiens

<220>
<221> Misc_Feature
<222> (1)..(10)
<223> Exonic splice silencer (ESS) nucleic acid sequence for hnRN A1.

<400> 5
uagggcaggc 10

<210> 6
<211> 10
<212> RNA
<213> Gallus gallus

<220>
<221> Misc_Feature
<222> (1)..(10)
<223> Exonic splice silencer (ESS) nucleic acid sequence for hnRNP A1.

<400> 6
uagggagggc 10

<210> 7
<211> 8
<212> PRT
<213> Homo sapiens

<220>
<221> SITE
<222> (1)..(1)
<223> Xaa represents a Lysine or an Arginine

<220>
<221> SITE
<222> (3)..(3)
<223> Xaa represents a phenylalanine or tyrosine.

<220>
<221> SITE
<222> (4)..(4)
<223> Xaa represents a glycine or alanine.

<220>
<221> Misc_Feature
<222> (7)..(7)

<223> Xaa can be any naturally ocurring amino acid.

<220>
<221> SITE
<222> (8)..(8)
<223> Xaa represents a phenylalanine or tyrosine.

<400> 7

Xaa Gly Xaa Xaa Pro Val Xaa Xaa
1 5

<210> 8
<211> 148
<212> PRT
<213> Homo sapiens

<220>
<221> Misc_Feature
<222> (1)..(6)
<223> Correspond to amino acids 16 - 21 of hnRNP A1.

<220>
<221> Misc_Feature
<222> (7)..(39)
<223> Correspond to amino acids 22 - 54 of hnRNP A1.

<220>
<221> Misc_Feature
<222> (40)..(47)
<223> Correspond to amino acids 55 - 62 of hnRNP A1.

<220>
<221> Misc_Feature
<222> (48)..(91)
<223> Correspond to amino acids 63 - 106 of hnRNP A1.

<220>
<221> Misc_Feature
<222> (92)..(97)
<223> Correspond to amino acids 107 - 112 of hnRNP A1.

<220>
<221> Misc_Feature
<222> (98)..(140)
<223> Correspond to amino acids 113 - 145 of hnRNP A1.

<220>
<221> Misc_Feature
<222> (141)..(148)
<223> Correspond to amino acids 146 - 153 of hnRNP A1.

<400> 8

Leu Phe Ile Gly Gly Leu Ser Phe Glu Thr Thr Asp Glu Ser Leu Arg

```
1               5                   10                  15

Ser His Phe Glu Gln Thr Gly Thr Leu Thr Asp Cys Val Val Met Arg
            20                  25                  30

Asp Pro Asn Thr Lys Arg Ser Arg Gly Phe Gly Pro Val Thr Tyr Ala
        35                  40                  45

Thr Val Glu Glu Val Asp Ala Ala Met Asn Ala Arg Pro His Lys Val
    50                  55                  60

Asp Gly Arg Val Val Glu Pro Lys Arg Ala Val Ser Arg Glu Asp Ser
65                  70                  75                  80

Gln Arg Pro Gly Ala His Leu Thr Val Lys Lys Ile Phe Val Gly Gly
                85                  90                  95

Ile Thr Val Lys Lys Ile Phe Val Gly Gly Ile Lys Glu Asp Thr Glu
            100                 105                 110

Glu His His Leu Arg Asp Tyr Phe Glu Gln Tyr Gly Lys Ile Glu Val
        115                 120                 125

Ile Glu Ile Met Thr Asp Arg Gly Ser Gly Lys Lys Arg Gly Phe Ala
    130                 135                 140

Phe Val Thr Phe
145
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<210> 9
<211> 28
<212> PRT
<213> Homo sapiens

<220>
<221> Misc_Feature
<222> (1)..(28)
<223> hnRNP A2 is defined as human hnRNP core protein.

<220>
<221> Misc_Feature
<222> (1)..(28)
<223> OTHER: Max number of positions shown; some may be missing.

<220>
<221> Misc_Feature

<222> (1)..(6)
<223> Correspond to amino acids 11 - 16 of hnRNP A2.

<220>
<221> Misc_Feature
<222> (7)..(14)
<223> Correspond to amino acids 50 - 57 of hnRNP A2.

<220>
<221> Misc_Feature
<222> (15)..(20)
<223> Correspond to amino acids 102 - 107 of hnRNP A2.

<220>
<221> Misc_Feature
<222> (21)..(28)
<223> Correspond to amino acids 141 - 148 of hnRNP A2.

<400> 9

Leu Phe Ile Gly Gly Leu Ala Gly Phe Gly Pro Val Thr Phe Leu Phe
1 5 10 15

Val Gly Gly Ile Arg Gly Phe Gly Phe Val Thr Phe
20 25

<210> 10
<211> 12
<212> PRT
<213> Homo sapiens

<220>
<221> Misc_Feature
<222> (1)..(12)
<223> hnRNP is defined as a human hnRNP core protein.

<220>
<221> Misc_Feature
<222> (1)..(12)
<223> Correspond to amino acids 3 - 14 of hnRNP B2.

<400> 10

Lys Thr Leu Glu Thr Val Pro Leu Glu Arg Lys Lys
1 5 10